Space Weather Forecast

Issued on Saturday 18 January 2025 at 13:12 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares (Minor-Moderate radio blackouts) expected throughout. Chance of strong flares (Strong radio blackouts) throughout. Decreasing Slight chance of minor geomagnetic storm.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was Moderate, with several Moderate-class X-ray flares observed, mainly emanating from a complex sunspot region in the northwest, peaking at 17/1335UTC.

There are now eight numbered sunspot regions on the Earth-facing side of the Sun. Foremost amongst these are one in the northwest, which has undergone rapid development in the past 48 hours, although this growth has been slower in recent hours. Also of note was the largest sunspot region on the facing side in the southeast. Other regions on the Sun appeared stable simple magnetic dipoles or unipoles.. No significant Earth directed Coronal Mass Ejection (CME)s were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were characterised by fast wind influence, likely to be connection to a large southern solar hemisphere 'coronal hole'. Solar winds were at elevated levels. The number of particles in the solar wind were slightly above average for much of the period, before dropping around 18/0830UTC to slightly below normal background, however the data is suspect. Their associated magnetic field was at mostly Weak levels.

The net result of the above solar wind measures was nevertheless below Minor Geomagnetic Storm G1 throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, despite Moderate-class X-ray flare activity.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected, with occasional Moderate-class flares. There is a Chance of Strong-class flares, most likely emanating from the most active group in the northwest, or perhaps the largest in the southeast.

Solar Wind / Geomagnetic Activity: No significant CMEs feature in the forecast, which comprises the ongoing waning effects of the current 'coronal hole' fast wind. This gives a decreasing chance of minor geomagnetic storm G1 with Quiet to Unsettled levels most likely to persist.

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Energetic Particles / Solar Radiation: High energy proton flux carries a daily slight chance of S1 Minor Solar Radiation storms, rising slightly with the westward advance of the most complex group and raised slightly relative to recent guidance given the increased cadence of potentially suitable flaring events.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	70	60	60
Very Active	R3-R5 (X Class)	No	20	20	15	15

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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